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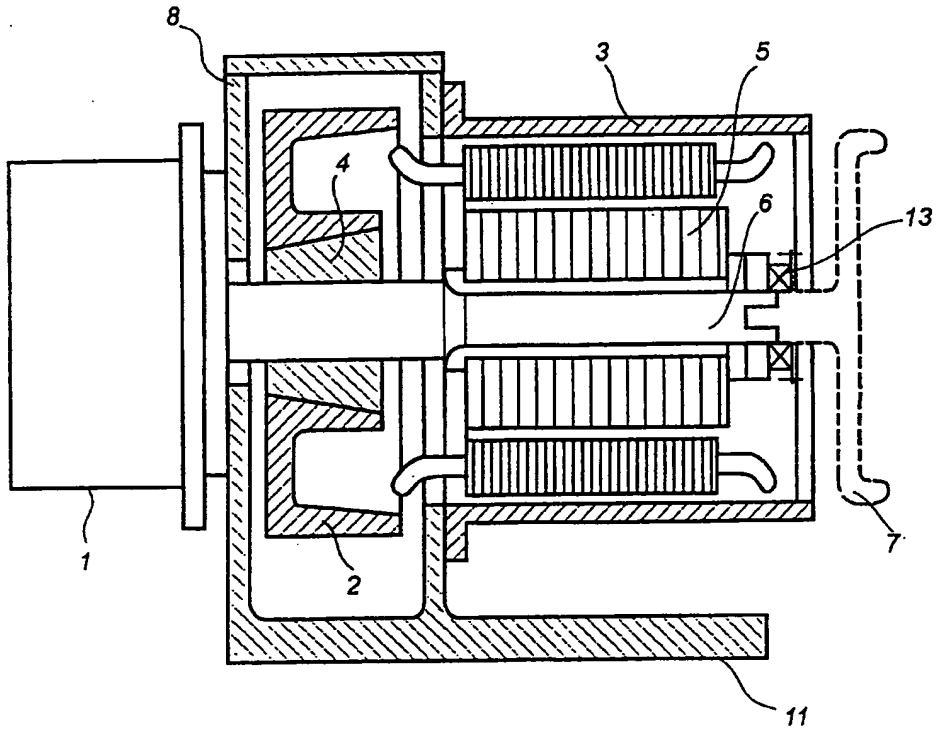

(57) Abrégé/Abstract:
The subject of the present invention is a drive unit for a hoist, for an elevator in particular, consisting of a motor 3, a transmission 1, a brake 2 and a brake housing 8 serving as post to a front face of which said motor and/or said transmission are flanged. The drive unit comprises a continuous shaft 6 forming the motor shaft as well as the transmission shaft and on which the brake members 2 are defined within said brake housing 8 on said shaft 6. Preferably, said motor 3 and/or said transmission 1 are flanged to said brake housing 8 in cantilever manner. Due to the embodiment in accordance with the pesent invention the total length of the drive unit can be reduced substantially. In addition, erection and assembling expenditure are reduced.

Background of the Invention

The invention relates to a drive unit for a hoist, an elevator in particular, comprising a motor, a transmission, a brake and a brake housing serving a support and to a front face of which the motor and/or the transmission are flanged.

In a known drive unit of this kind (WO 89/11436) the drive shaft guided through the brake housing consists of three parts mutually connected by two couplings. Therein, one of said couplings is formed by the brake disk support to which a brake disk is formed integrally. Said three-part shaft with the two shaft couplings of which one is additionally provided with a length balance increases the structural length of the drive unit, increases the mass of the rotating parts and promotes vibrations.

Summary of the Invention

It is, therefore, the main object of the present invention to have a drive unit of the above-cited type of design which has a simple construction, a short structural length, wherein low inertia forces are created.

Therefore this invention seeks to provide a drive unit for a hoist, for an elevator in particular, comprising a motor (3), a transmission (1), a brake (2) and a brake housing (8) serving as support and to a front face of which the motor and/or the transmission are flanged, characterized in that a continuous shaft (6) forms the motor shaft as well as the transmission shaft, and that a brake body (2) is defined within said brake housing (8) on said shaft (6).

Due to the fact that the motor shaft and the transmission shaft are formed by a one-part continuous shaft and that the brake body is defined within the brake housing on said shaft, the total length of the drive unit can be

substantially reduced, this being an essential advantage in the generally very narrowed place for installing elevator drives. Additionally, the installation and the assembling expenditure are reduced.

Preferably, the motor and the engine are flanged on both sides of the brake housing in cantilever manner. They thus form a structural unit which can be pre-assembled and does not require alignment work during installation of the hoist but has to be defined at the foundation as single component. Depending on the kind of design of the transmission the latter can also be flanged to the brake housing on the drive side and be connected to the motor at the driving end.

The brake can be realized as drum brake or disk brake or, if required, also in accordance with other structural principles. The parts absorbing the braking forces there-

in either are defined at the brake housing or at a separate support.

The brake body, e.g. the brake drum or brake disk, preferably are fixed to the continuous shaft by means of a flange or a cone clutch, so that a partial or complete exchange is possible without excess expenditure. Accessibility is further improved in that the brake housing has openings through which the brake is accessible.

If a planetary gear is used as transmission, it is flanged to the side not facing the motor, of the brake housing in advantageous manner. The outer sleeve of the planetary transmission can then be built as pulley protruding into the elevator shaft, for the ropes of an elevator, this resulting in a further saving of structural length.

The manner of flanging the transmission in accordance with the present invention in advantageous manner also permits the use of other kinds of transmission, like e.g. spur gears, play-free precision gears and combination gears. Simultaneously, a room-saving embodiment of an pulse generator which can be used for controlled drives can be supported on the drive shaft. Said pulse generator can be integrated into the space of the motor housing or can be formed by the motor drive shaft bearing.

In the following the invention will be explained in more detail with reference to the attached drawings.

List of Figures

FIG. 1 is a vertical partial cut view through a drive unit in accordance with the present invention.

FIG. 2 is a cross-sectional view of the brake housing having a brake formed as drum brake.

FIGs. 3a and 3b show a drive unit having a disk brake in longitudinal and cross section.

FIGs. 4a and 4b show a cone clutch for mounting the brake body on the shaft in longitudinal and cross section.

Detailed Account of Working Example of the Invention

FIG. 1 schematically shows a drive unit for an elevator with the basic structural members transmission 1, brake 2 and motor 3, which are arranged equiaxially. Said transmission 1 is built as planetary transmission and on its outer sleeve carries a pulley (not shown) for the ropes of an elevator.

8 refers to a brake housing integrally connected to a rigid base plate 11. Said base plate 11 continues till under said motor 3 and is anchored on a foundation (not shown).

Said planetary transmission 1 is flanged with its stationary part to the left-hand side in Fig. 1, of said brake housing 8. In the same way, the housing of the motor 3 is fixed at the right-hand side of said brake housing 8.

The rotor 5 of said motor 3, the brake body of said brake 2 and the entry part of said planetary transmission 1 are seated on a common shaft 6 extending as continuous shaft through the entire drive unit. A handwheel 7 for emergency actuation can be mounted onto the free end of said shaft 6 at the side of the motor. Furthermore, a pulse generator 13 which bears on the inner face of the motor housing cover is supported on the free end of said shaft 6. The brake body formed as drum or disk is defined on said shaft 6 by means of a known cone clutch, as is schematically shown in FIGs. 4a and 4b.

As can be seen from FIG. 3a, the free end of said shaft 6 can be accommodated in a support bearing 14 which can be formed as pulse generator. Said support bearing or said free end of the shaft can be covered by a removable cap 15.

Said cap can be provided with a safety contact for making sure when mounting the handwheel that the drive unit will not be activated.

Various constructions can be used for the brake. In FIGs. 1 and 2, a drum brake is shown in which braking shoes 12 are pressed against the brake body via lever 9 and a brake cylinder 10. In contrast thereto, FIGs. 3a and 3b show a disk brake, also including levers 9 and a cylinder 10.

In both cases said levers 9 absorbing the braking force are fixed to said brake housing 8. They can, however, also be supported at the foundation independently of said brake housing 8, so that the braking forces absorbed from the moving masses are not diverted through said brake housing 8. In that case it is possible to mount and install the braking unit as complete unit on a support.

Instead of the planetary transmission provided for in the exemplary embodiment of the present invention it is also possible to use a transmission having another known construction. Therein it also is possible to flange a unit formed as transmission motor to the one side of said brake housing and to mount a pulley for the support ropes on the end of said shaft 6 protruding on the other side.

The essential advantages of the drive unit in accordance with the present invention essentially lie in the substantially shortened construction by omission of the clutch and by the arrangement of a continuous shaft together with supporting the brake on said shaft close to the transmission or pulley support, respectively, whereby the centrifugal masses are reduced and can be absorbed in better way and whereby the motor support bearing provided for in common constructions can be omitted. The brake housing can comprise lateral openings through which the brake can be surveilled and is accessible so that wear can be observed and easy exchange of brake parts is possible.

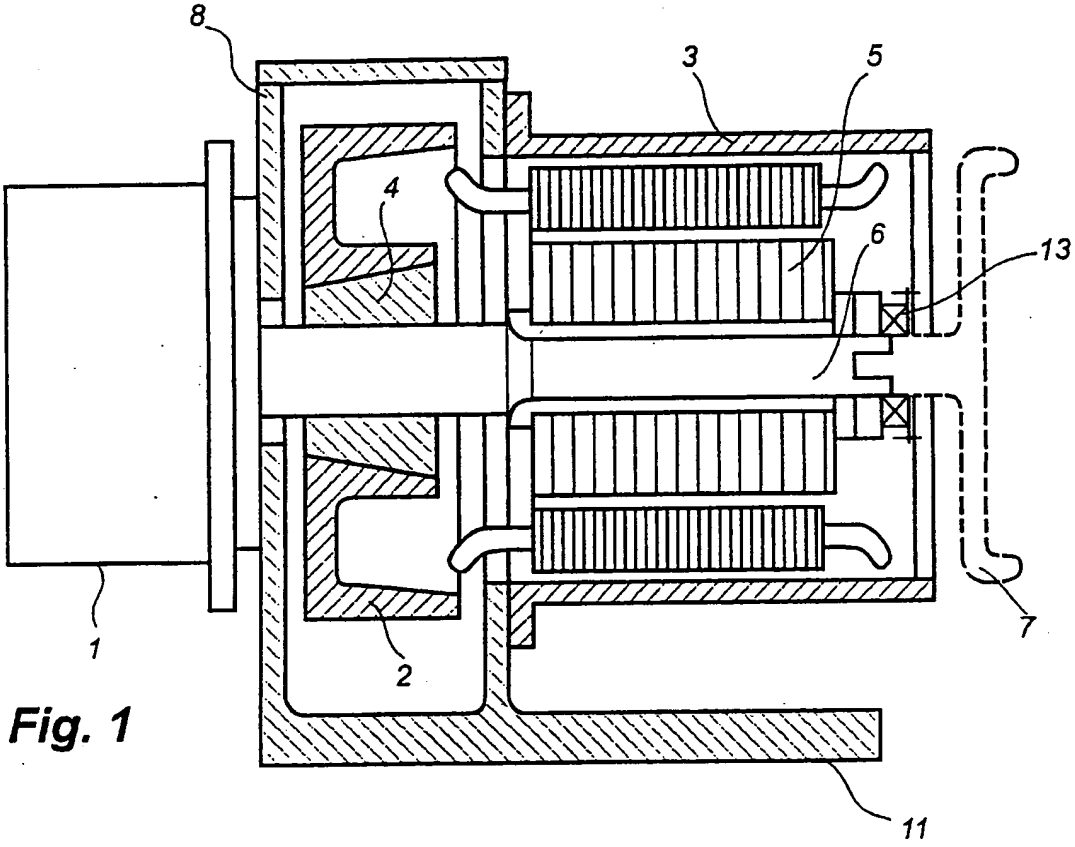

Fig. 1

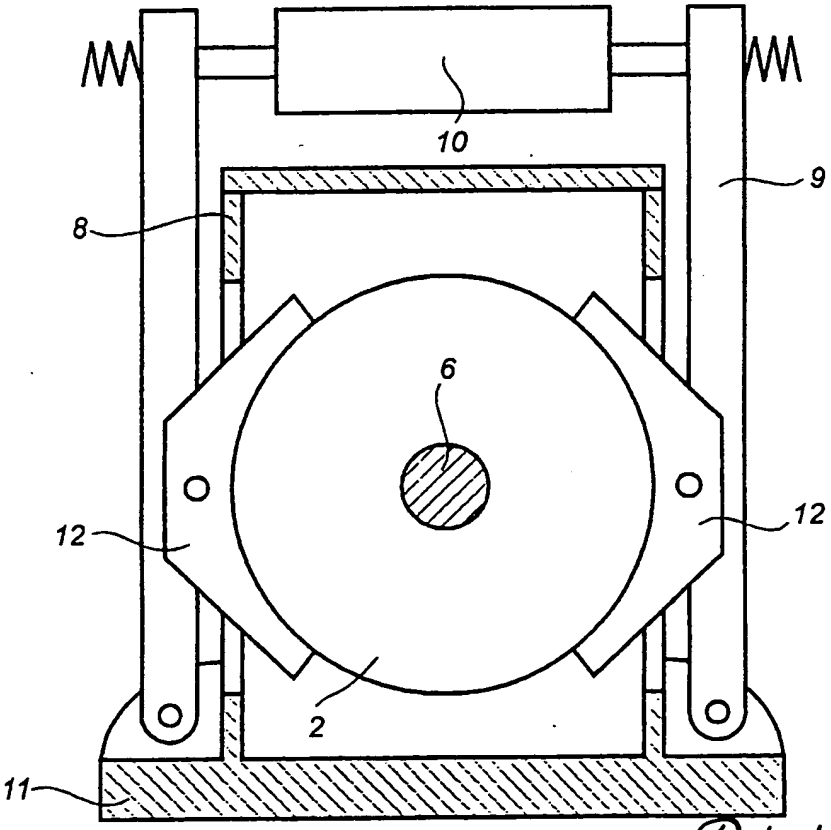

Fig. 2

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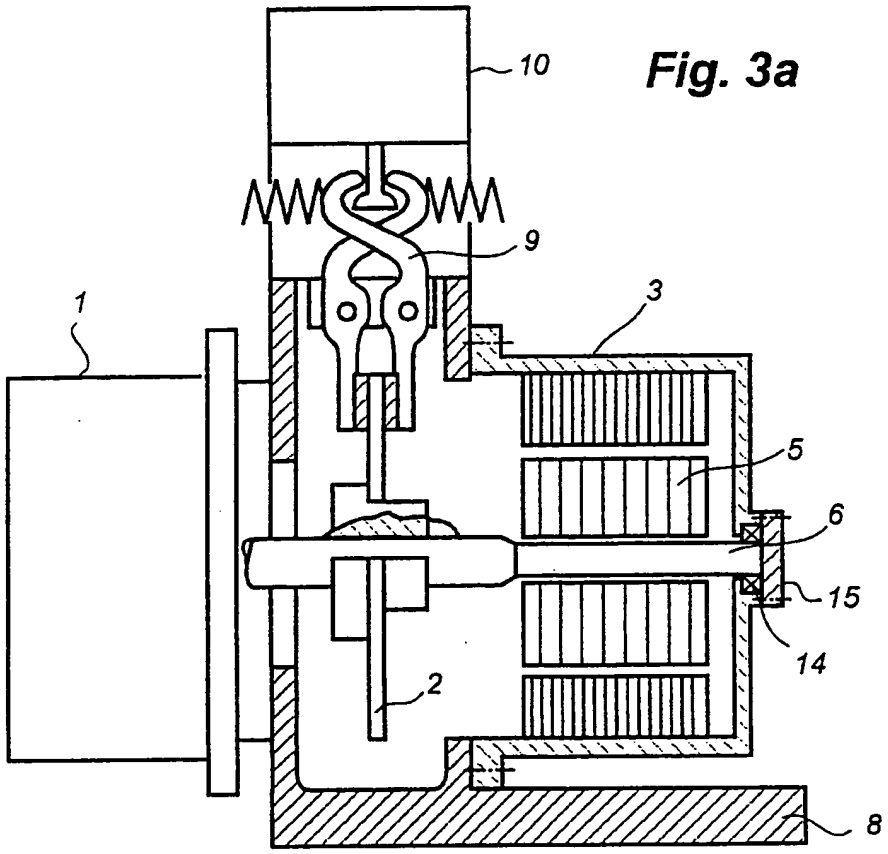

Fig. 3a

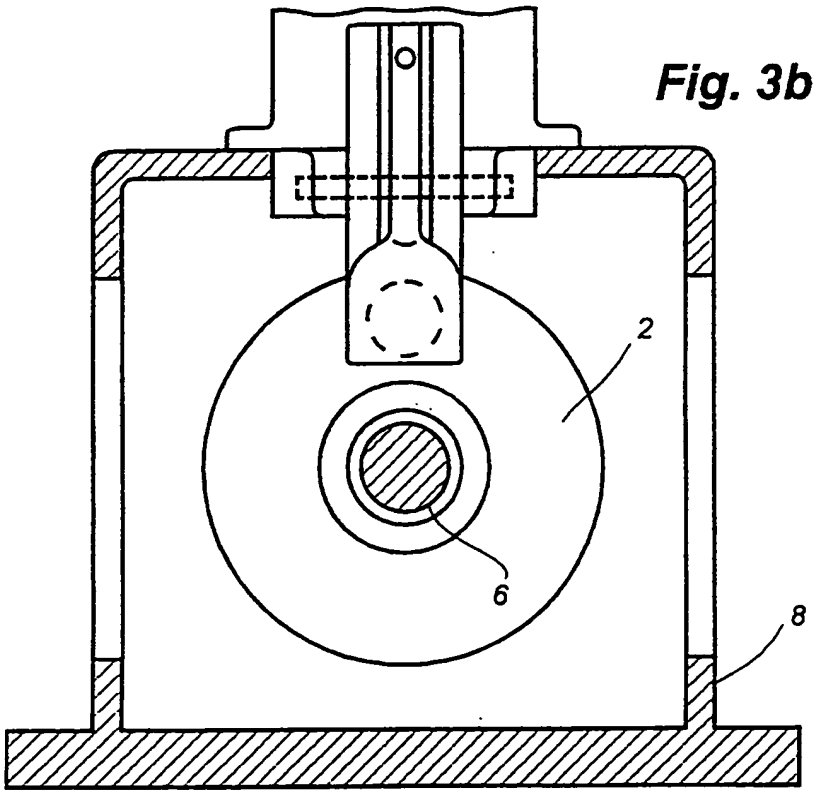

Fig. 3b

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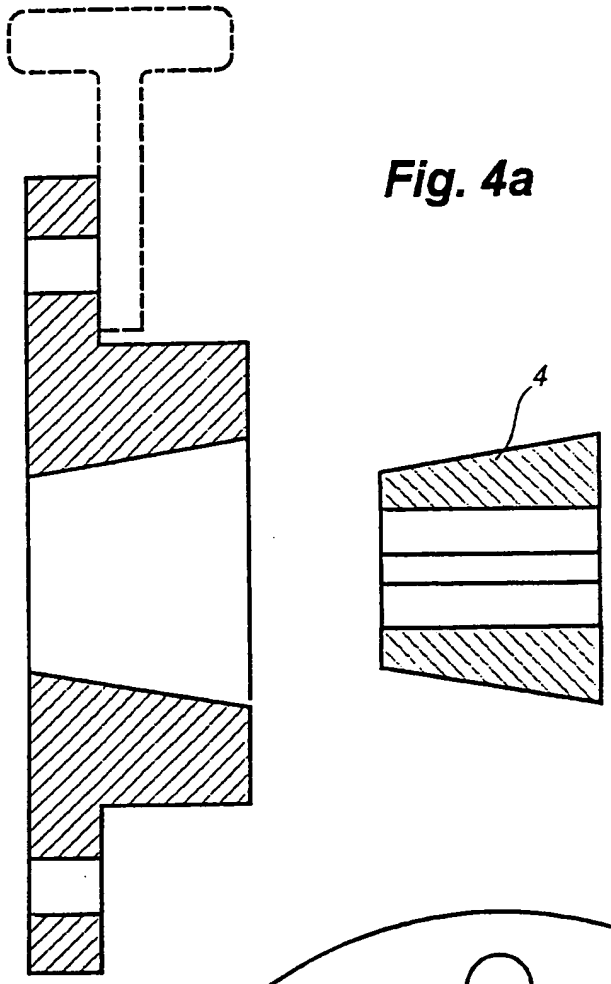
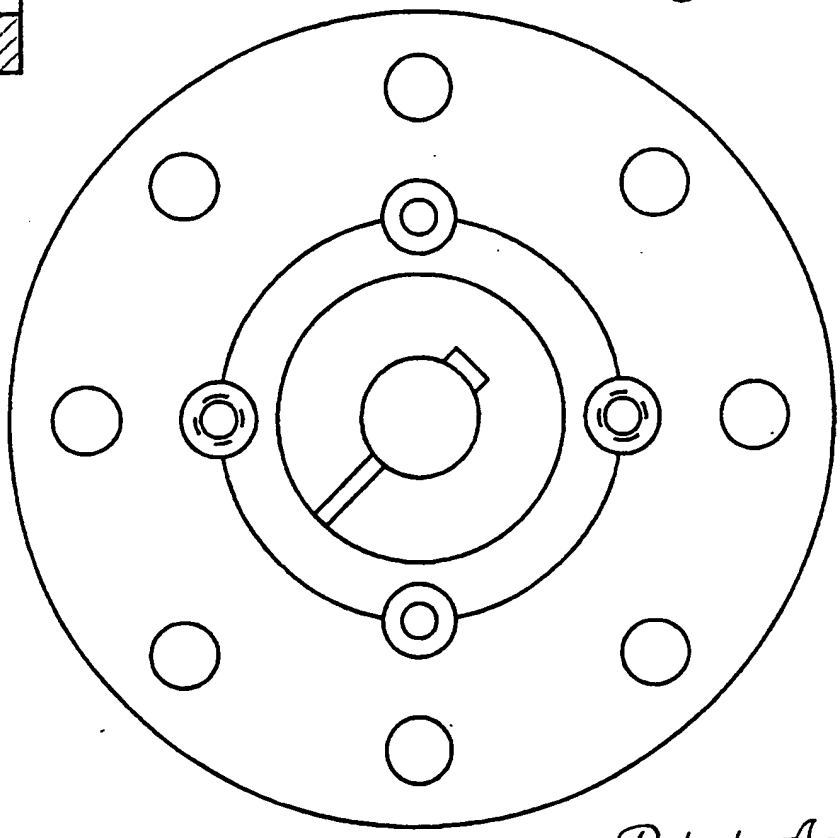


Fig. 4a

Fig. 4b



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CLAIMS:

1. A drive unit for a hoist, for an elevator in particular, comprising a motor (3), a transmission (1), a brake (2) and a brake housing (8) serving as support and to a front face of which the motor and/or the transmission are flanged, characterized in that a continuous shaft (6) forms the motor shaft as well as the transmission shaft, and that a brake body (2) is defined within said brake housing (8) on said shaft (6).

2. A drive unit as defined in claim 1, characterized in that said motor (3) and/or said transmission (1) are flanged to said brake housing (8) in cantilever manner.

3. A drive unit as defined in claim 1 or 2, characterized in that said brake (2) is built as a drum brake.

4. A drive unit as defined in claim 1 or 2, characterized in that said brake (2) is built as a disk brake.

5. A drive unit as defined in any one of claims 1 to 4, characterized in that parts absorbing the braking forces are located at said brake housing (8).

6. A drive unit as defined in any one of claims 1 to 4, characterized in that parts absorbing the braking forces are defined at a separate support.

7. A drive unit as defined in any one of claims 1 to 6, characterized in that said brake body is mounted to a flange formed at said shaft (6).

8. A drive unit as defined in any one of claims 1 to 6, characterized in that said brake body is defined at said shaft (6) by means of a cone clutch.

9. A drive unit as defined in any one of claims 1 to 8, characterized in that said brake housing (8) comprises opening through which said brake (2) is accessible.

10. A drive unit as defined in any one of claims 1 to 9, characterized in that said brake housing (8) is lengthened by a base plate (11) which protrudes under said motor (3) wherein said motor and transmission are flanged on both sides of said brake housing in a cantilever manner.

11. A drive unit as defined in any one of claims 1 to 10, characterized in that said transmission (1) is a planetary transmission.

12. A drive unit as defined in any one of claims 1 to 11, characterized in that said transmission (1) is built as transmission on parallel axes.

13. A drive unit as defined in any one of claims 1 to 12, characterized in that said transmission (1) is built as play-free precision transmission of the type of a Cyclo† or a Harmonic* Drive Transmission in particular.

14. A drive unit as defined in any one of claims 1 to 13, characterized in that said transmission (1) is built as combination transmission under the transmission structures as defined in claims 11, 12 and/or 13.

15. A drive unit as defined in any one of claims 1 to 14, characterized in that an outer sleeve of the transmission is built for accommodating a support device, for a pulley for the ropes of an elevator in particular.

† * Cyclo and Harmonic are Registered Trade-marks

16. A drive unit as defined in any one of claims 1 to 14, characterized in that said transmission (1) at the drive side thereof comprises a shaft built for accommodating a support device, for a pulley for the ropes of an elevator in particular.

17. A drive unit as defined in claim 15, characterized in that said transmission (1) at the drive side thereof comprises a shaft built for accommodating the support device.

18. A drive unit as defined in any one of claims 1 to 17, characterized in that said transmission (1) at the drive side thereof comprises an opening for receiving a power take-off shaft.

19. A drive unit as defined in any one of claims 1 to 18, characterized in that a pulse generator (13, 14) is supported on said drive shaft (6).

20. A drive unit as defined in any one of claims 1 to 19, characterized in that the support bearing (14) of said drive shaft (6) is built as pulse generator.

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